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April 22, 1994

HAND CARRIED

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
Washington, D.C. 20554

RE: ET Docket No. 93-62

Dear Mr. Caton:

Submitted herewith are the original and four copies of the reply comments of Jules Cohen & Associates, P.C., relative to the referenced docket.

Respectfully submitted,

JULES COHEN & ASSOCIATES, P.C.

By: Jules Cohen
Jules Cohen, P.E.

Enclosures

cc: Dr. Robert F. Cleveland
Environmental Protection Agency
National Association of Broadcasters
Hammett & Edison, Inc.
National Public Radio
Wiley, Rein & Fielding (Counsel for CBS Inc. *et al*)
Booth, Freret & Imlay (Counsel for American Radio Relay League, Inc.)

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Guidelines for Evaluating Environmental Effects of Radiofrequency Radiation	)))	ET Docket No. 93-62

REPLY COMMENTS OF
JULES COHEN & ASSOCIATES, P.C.
FCC NOTICE OF PROPOSED RULE MAKING

Jules Cohen & Associates, P.C. ("JC&A") respectfully submits the following *Reply Comments* in the matter of the subject docket.

I. Comments of the Environmental Protection Agency

Comments of the United States Environmental Protection Agency ("EPA") are of particular interest because of the role assigned to that agency by the Congress. We were dismayed with both the content and tone of the EPA comments. One of the undersigned (Cohen) had followed the entire process of developing the 1992 ANSI/IEEE standard from its inception, he had noted the presence and participation of EPA personnel at meetings of Subcommittee 4 of IEEE Standards Coordinating Committee 28, and had joined in the work of the Risk Assessment Working Group, chaired by an EPA staff member. In the absence of objections from the EPA staff during the standard development process, failure to support use of ANSI/IEEE C95.1-1992 was, to say the least, surprising.

EPA purports to favor use of the National Council on Radiation Protection and Measurements ("NCRP") 1986 criteria for limiting exposure to RF fields, although the employment of limits on induced and contact currents, as specified in C95.1-1992 is supported. EPA claims superiority of the NCRP on grounds that: (1) greater protection is provided at the higher microwave frequencies, (2) division between the two tiers of the standard is better defined

by use of "workplace" and "general population" than between "controlled" and "uncontrolled" environments, (3) C95.1-1992 is a thermal standard providing no protection from athermal exposures, (4) low power personal communications devices can induce relatively high SARs in portions of bodies of nearby persons, (5) NCRP contains modulation restrictions absent in ANSI/IEEE, and (6) NCRP is chartered by Congress. Of special interest to note is the fact that in the most critical range near human body resonance, the NCRP and ANSI/IEEE standards agree. Of course they should because both are based on a specific absorption rate (SAR) of 4 watts per kilogram with additional safety factors of 10 and 50 for the two tiers.

Increased MPE at high frequencies: ANSI/IEEE 1992 is, in some respects, actually more protective than NCRP at the high microwave frequencies where the MPE has been doubled from the 1982 standard, when consideration is given to the specified averaging time. At 100 GHz, NCRP allows exposure of the public to be 1.0 mW/cm^2 for 30 minutes. At the same frequency, ANSI/IEEE '92 allows 10 mW/cm^2 but only for 37 seconds. The total energy absorption allowed would be approximately five times greater under the NCRP standard than under the ANSI/IEEE standard. Truly, at 15 GHz, ANSI/IEEE would allow more total energy absorption than NCRP for the public since their standard is 1.0 mW/cm^2 for 30 minutes, whereas ANSI/IEEE allows 10 mW/cm^2 for six minutes; however, the differential is minor. The rationale for both the 10 mW/cm^2 and the exposure time at the higher frequencies has been provided by ANSI/IEEE (p. 33). The EPA has not addressed that rationale at all. (Note: page references are to the *ANSI/IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.*)

Controlled/uncontrolled environments vs. workers/public: Use of the "workers/public" rather than "controlled/uncontrolled" definition provides less certainty of protection than "controlled/uncontrolled," not more. Under the uncontrolled category, ANSI/IEEE '92 includes office workers in an industry that employs RF radiation as an important element of its business. The definition of the uncontrolled environment (p. 12) specifies that the exposure may be in a workplace as well as in living quarters. Under NCRP, these people would be "workers" and the higher permissible levels would apply. As to the charge that the specially susceptible subgroups of the population are not being protected, that is not so. No home, hospital, nursing home, school, playground, park, or other gathering place where people are likely to stay for extended periods

of time could be classified as a "controlled environment." A common sense reading of the definitions, together with the rationale, provide adequate guidance as to which tier applies.

Thermal standard: It is true that the 4 W/kg threshold can be regarded as thermal, even though the stress induced is well within the normal range tolerated by human and non-human animals. But the literature with respect to phenomena classified as nonthermal was not ignored. The fact is that no credible evidence could be found that exposure to energy levels below that producing some elevation of core temperature had any cognizable adverse impact on the health of the animal. The ANSI/IEEE standard is based on energy absorption and not on raising, or not raising, body temperature. Employment of the NCRP standard can hardly be claimed to protect better against athermal effects, if they do exist, since the SAR basis for the NCRP standard is identical to the SAR basis for the ANSI/IEEE standard.

Low power exclusion: NCRP supports the ANSI/IEEE position. Starting on page 284 and continuing on page 285 of NCRP Report No. 86, we find: "However, in the case of individuals in the general population who use radio emitters of various kinds (e.g., hand-held transceivers, remote control devices, etc.), the exposures of these individuals may be greater than the values recommended for the general population. Use of such devices is permitted, as a personal decision by the individual, provided that the devices are designed and used as designed so that the exposure of the individual does not exceed the occupational guidelines and provided that, in using the device, the individual does not expose other persons above the population guidelines." The likelihood of exposing nearby persons to levels in excess of the uncontrolled environment permitted levels is extremely remote, considering the power employed by devices that would qualify under the low power exclusion rule.

Modulation restrictions: NCRP requires: "If the carrier frequency is modulated at a depth of 50 percent or greater at frequencies between 3 and 100 Hz, the exposure criteria for the general population shall also apply to occupational exposures." (p.286 of NCRP Report No. 86) In the same paragraph, NCRP states: "It is not known whether these effects [of RFEM fields under low-frequency modulation] pose a risk to health..." Perhaps of even greater significance is that this provision is quite meaningless. There is no known use of any device that uses such a level of modulation of low frequencies for any extended period of time. Driving a transmitter at frequencies below 100 Hz at amplitude modulations in excess of 50 percent takes a great deal of

power. Such modulation appears only momentarily in music, and would certainly not persist for anything close to six minutes.

NCRP chartered by Congress: Chartering by Congress does not make the NCRP an arm of the Federal Government, nor provide it with special status. Chartering took place in 1964, although the organization was started before that date; however, compared to the IEEE (successor to the AIEE and IRE) and to ANSI, the NCRP is the "new kid on the block." NCRP Report No. 86 was prepared by a six-person committee, with five advisory members (including Dr. Eleanor R. Adair, co-chair of Subcommittee 4 responsible for the ANSI/IEEE standard) and five consultants. That number is to be contrasted with the approximately 120 members of Subcommittee 4. The Subcommittee 4 membership included scientists skilled in the biological/medical art and engineers. They were drawn from academia, government, and industry. Furthermore, nine of the sixteen people named as having something to do with development of the NCRP standard served also on Subcommittee 4.

II. Induced and Contact Currents

Concern relative to the imposition of restrictions on induced and contact currents constitutes a major theme running through comments filed in response to the NPRM. That concern is expressed most forcefully by those identified with broadcasting, the industry most affected by such regulations. Principal among those commenting were the National Association of Broadcasters, Hammett & Edison, National Public Radio and CBS, *et al.* The *Joint Comments of CBS, Inc., Tribune Broadcasting Company and Westinghouse Broadcasting Company, Inc.* are particularly useful, in large part because of the work done by Alan Parnau of CBS and reported in Appendices to the *Joint Comments.*

Parnau has shown that instrumentation currently available cannot be relied upon to produce repeatable induced current data, nor can the results be used with any sense of confidence that they truly represent the induced currents flowing through the body. Sufficient data have been collected to provide at least a suggestion that "real world" induced currents, as contrasted to the "worst case" analyses by Cohen, are sufficiently low that the imposition of induced current restrictions may not be required. Conformance with maximum permissible exposure to electric and magnetic fields may be sufficient to protect humans from adverse effects of exposure.

JC&A supports the position of commenters that regulation of induced and contact current limits should be held in abeyance until: (1) devices capable of making reliable, repeatable measurements are available, (2) a protocol is developed for measurement technique, and (3) a program of measurements is carried out to determine whether current limits are required at all, or, at least, under what circumstances of electric field exposure should current measurements be required. Considering the substantial burden that could be imposed on broadcasters if current restrictions are adopted without a substantial data base supporting those restrictions, we are certain that the broadcasting community can be trusted to supply substantial resources for a cooperative effort with the Commission to establish that data base.

III. Conclusions

The Commission has wide, and deserved, support for adoption of the 1992 ANSI/IEEE RF protection standard to replace the 1982 standard now in place. A proposal such as that of the American Radio Relay League, Inc. to terminate the proceeding without action is irresponsible. An expert body spent approximately eight years and thousands of man-hours to develop the new standard. The scientific literature consisting of thousands of papers was reviewed for pertinent material. The EPA terminated its work on the development of a standard in 1988 without action. The Council on Environmental Quality is not organized for such an effort. Other standard setting organizations, including the NCRP, have adopted criteria in good agreement with ANSI/IEEE C95.1-1992. Except for current-limiting regulations, requiring additional study and the development of suitable measuring devices, the Commission should adopt the criteria of the 1992 ANSI/IEEE standard, waiting only for a revision of OST Bulletin No. 65 to provide compliance guidance, and a reasonable period for affected industries to make whatever adjustments may be necessary to achieve compliance.

Jules Cohen & Associates, P.C.

Jules Cohen, Consultant to the Firm

Robert W. Denny, Jr., President

April 22, 1994